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To: Commissioner of Patents and Trademarks
Washington, D.C. 20231

Fr: George O. Saile, Reg. No. 19,572
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Subject: Serial No. 10/042,570 01/09/02

Tsou et al.

METHOD OF FORMING HIGH QUALITY WAVEGUIDES BY VAPOR-PHASE PROTON-EXCHANGE PROCESS WITH POST-THERMAL ANNEALING AND REVERSED PROTON-EXCHANGE

Grp. Art Unit: 2873

INFORMATION DISCLOSURE STATEMENT

Enclosed is Form PTO-1449, Information Disclosure Citation In An Application.

The following Patents and/or Publications are submitted to comply with the duty of disclosure under CFR 1.97-1.99 and 37 CFR 1.56. Copies of each document is included herewith.

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on March 15, 2002.

Stephen B. Ackerman, Reg.# 37761

Signature/Date Stephen B. Ackerman 3/15/02

J. Rams et al. article entitled "Nonlinear optical efficient LiNbO3 waveguides proton exchanged in benzoic acid vapor: Effect of the vapor pressure," Journal of Applied Physics, Vol. 85, No. 3, pp. 1322-1328 (Feb.1, 1999), describes the effect of the vapor pressure on the properties of LiNbO3 waveguides proton-exchanged in bensoic acid vapor.

J. Rams et al. article entitled "Preparation of proton-exhange LiNbO3 waveguides in bensoic acid vapor," J. Opt. Soc. Am. B, Vol. 16, No. 3, pp. 401-406 (March 1999), describes formation of alpha- or beta-phase LiNbO3 waveguides by proton-exchange of x- and z-cut substrates in benzoic acid vapor.

M.L. Bortz et al., article entitled "Depth profiling of the d33 nonlinear coefficient in annealed proton exchanged LiNbO3 waveguides," Appl. Phys. Lett., Vol. 62, No. 17, pp. 2012-2014 (April 26, 1993), describes depth profiling of the d33 nonlinear coefficient in annealed proton-exchanged LiNbO3 waveguides using reflected second-harmonic generation from angle-lapped samples.

J.L. Jackel et al. article entitled "Reverse Exchange Method for Burying Proton Exchanged Waveguides," Electronics Letters, Vol. 27, No. 15, pp. 1360-1361 (July 18, 1991), describes formation of buried proton-exchanged LiNbO3 waveguides.

Yu N. Korkishko et al. article entitled "Reverse proton exchange for buried waveguides in LiNbO3," J. Opt. Soc. Am. A, Vol. 15, No. 7, pp. 1838-1842 (1998), describes a reverse proton-exchange (RPE) process performed in different HxLi1-xNbO3 crystalline phases of proton-exchanged and annealed proton-exhanged LiNbO3 waveguides.

The Ming-Hsin Chou (a co-inventor of the instant invention) dissertation entitled "Optical Frequency Mixers Using Three-Wave Mixing for Optical Fiber Communications" submitted to the Department of Applied Physics and the Committee on Graduate Studies of Stanford University in partial fulfillment of the requirements for the degree of Doctor of Philosophy (August 1999) describes the development of optical frequency (OF) mixers fabricated in periodically poled LiNbO3 (PPLN) waveguides for optical fiber communications and other all-optical signal processing applications.

U.S. Patent 5,521,750 to Onoe et al., "Process for Forming Proton Exchange Layer and Wavelength Converting Element," describes a process for forming proton-exchange layer and wavelength converting element.

U.S. Patent 4,948,407 to Bindell et al., "Proton Exchange Method of Forming Wafeguides in LINBO3," describes a proton-exchange method of forming waveguides in LiNbO3.

U.S. Patent 5,734,494 to Xu et al., "Wavelength Conversion Device and Wavelength Conversion Method," describes a wavelength conversion device and wavelength converson method.

U.S. Patent 5,838,486 to Sonoda et al., "Optical Wavelength Conversion Element, Method of Manufacturing the Same and Optical Wavelength Conversion Module," describes an optical wavelength conversion element, a method of manufacturing the same, and an optical wavelength conversion module.

U.S. Patent 5,991,490 to Mizuuchi et al., "Optical Waveguide and Optical Wavelength Conversion Device," describes an optical waveguide and optical wavelength conversion device.

U.S. Patent 5,872,884 to Mizuuchi et al., "Optical Waveguide Conversion Device," describes an optical waveguide conversion device.

U.S. Patent 6,002,515 to Mizuuchi et al., "Method for Producing Polarization Inversion Part, Optical Wavelength Conversion Element Using the Same, and Optical Waveguide," describes a method for producing a polarization inversion part, an optical wavelength conversion element using the same, and an optical waveguide.

U.S. Patent 5,943,465 to Kawaguchi et al., "Optical Waveguide Element, Optical Element, Method for Producing Optical Waveguide Element and Method for Producing Periodic Domain-Inverted Structure," describes an optical waveguide element, an optical element, a method for producing an optical waveguide element and a method for producing periodic domain-inverted structure.

U.S. Patent 5,761,226 to Gupta, "Frequency Conversion Laser Devices," describes frequency conversion laser devices.

U.S. Patent 5,652,674 to Mizuuchi et al., "Method for Manufacturing Domain-Inverted Region, Optical Wavelength Conversion Device Utilizing Such Domain-Inverted Region and Method for Fabricating Such Device," describes a method for manufacturing domain-inverted regions, optical wavelength conversion devices utilizing such domain-inverted regions and a method for fabricating such a device.

U.S. Patent 5,875,053 to Webjorn et al., "Periodic Electric Field Poled Crystal Waveguides," describes periodic electric field poled crystal waveguides.

U.S. Patent 4,925,263 to Sanford et al., "Proton-Exchanged Waveguides for Sum-Frequency Generation," describes proton-exchanged waveguides for sum-frequency generation.

U.S. Patent 5,434,700 to Yoo, "All-Optical Wavelength Converter," describes an all-optical wavelength converter.

U.S. Patent 5,317,666 to Agostinelli et al., "Waveguide Nonlinear Optical Frequency Converted with Integral Modulation and Optimization Means," describes a waveguide nonlinear optical frequency converter with integral modulation and optimization means.

U.S. Patent 5,380,410 to Sawaki et al., "Process for Fabricating an Optical Device for Generating a Second Harmonic Optical Beam," describes a process for fabricating an optical device for generating a second harmonic optical beam.

U.S. Patent 5,249,191 to Sawaki et al., "Waveguide Type Second-Harmonic Generation Element and Method of Producing the Same," describes a waveguide type second-harmonic generation element and method of producing the same.

U.S. Patent 5,155,791 to Hsiung, "Hybrid Optical Waveguides for Phase-Matched Nonlinear Wavelength Conversion," describes hybrid optical waveguides for phase-matched nonlinear wavelength conversion.

Sincerely,

Stephen B. Ackerman, Reg. #37761